BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Foundation Diploma in Engineering Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Diploma in Electrical/Electronic Engineering Pearson BTEC International Level 3 Diploma in Mechanical Engineering Pearson BTEC International Level 3 Diploma in Digital Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Electrical/Electronic Engineering Pearson BTEC International Level 3 Extended Diploma in Mechanical Engineering Pearson BTEC International Level 3 Extended Diploma in Digital Engineering
Unit number and title	**Unit 21: Electronic Measurement and Testing of Circuits**
Learning aim(s)	**B**: Explore fault-finding techniques and test plans used when measuring and testing electronic circuits **C**: Carry out measurements and tests on analogue and digital electronic circuits to identify faults safely
Assignment title	Fault finding techniques and fault identification in analogue and digital circuits.
Assessor	
Issue date	
Hand in deadline	
Vocational Scenario or Context	You are a first year Apprentice with a company that makes bespoke products for a wide range of industries. Many of the products contain electronic circuits, which are designed and made in-house. Your Supervisor is happy with your progress and your understanding of how test and measuring equipment work. Your Supervisor has decided that you can move onto the next stage of your placement with the Measurement and Testing Department, where you will explore different fault-finding methods and techniques that are used to identify faults in different types of circuit.
Task 1	You have been asked to plan and carry out practical fault finding activities on a range of circuits, including one combinational and one sequential circuit, that have are known to have a fault. You will need to find the root causes of the faults, and use standardised documentation to record your findings efficiently and effectively and optimise future plans **To do this**: Your tutor will provide you with a range of analogue and

	complex digital circuits that are known to have a fault. You need to produce a report that includes the following information for the circuits that you are testing: • A test-plan that identifies appropriate fault-finding techniques for each of the supplied analogue and digital circuits. • Reasons why you have used the techniques chosen for each plan, including comparisons with other methods you could have used. **You should then:** Use your test plans to identify faults in at least two analogue circuits and at least two complex digital circuits. You will need to keep a log of the testing activities that: a) provides evidence of carrying out the tests; b) identifies the cause of the faults; and c) makes reference to modifications to the test plan. To do this, you should: • Use your test and fault finding plan for each circuit, recording the outcomes of each test using standardised documentation. • Use the results of your tests to identify the root cause of the fault for each circuit. • Explain any modifications and refinements you have made to the test plan, where this has been necessary, including reasons for making the changes • Explain how your results are accurate and consistent
Checklist of evidence required	A test plan to analyse each electronic circuit, detailing the fault-finding techniques to be used and preparation tasks to be undertaken. It will also explain the rationale behind the application of different techniques. A logbook and fault-finding record for the circuits, detailing tests undertaken, symptoms and final identification of the faulty components in analogue and digital circuits, including test results and annotated photographs. You should also include one or more observational witness statements.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
21/BC.D2	Optimise a fault-finding test plan and carry out the identification of faults correctly and safely for two analogue circuits and two digital circuits, each with less than four stages, justifying the effectiveness of the test processes and any further improvements to be made.
21/B.M2	Produce an effective fault-finding test plan for two analogue circuits and two digital circuits, each with less than four stages, comparing testing techniques.
21/C.M3	Identify faults correctly and effectively in two analogue circuits safely, while recording the results accurately.
21/C.M4	Identify faults correctly, safely and effectively in one combinational and one sequential logic circuit, each with less than four stages, while recording the results accurately.
21/C.P4	Identify faults correctly and safely in at least one analogue circuit.
21/C.P5	Identify faults correctly and safely in at least one combinational and/or one sequential logic circuit, each with less than four stages.
Sources of information to support you with this Assignment	Books Electronic Test Instruments: Analog and Digital Measurements; Witte R; Prentice Hall (2002); ISBN-13: 978-0130668301 Electronic Measurement and Testing: Tips and Techniques for Technicians and Engineers; Bartlett E R; ISBN-13: 978-0070039612 Electronic Testing and Fault Diagnosis; Loveday G; (Longman (1995); ISBN-13: 978-0582252424 How to Diagnose and Fix Everything Electronic; Geier M J; McGraw-Hill Education TAB; ISBN-13: 978-0071848299 Websites http://www.electronics-tutorials.ws/ http://www.radio-electronics.com/info/t_and_m/ http://qualifications.pearson.com/en/support/published-resources.html#step1
Other assessment materials attached to this Assignment Brief	Pre-built analogue and digital circuits with several switched faults